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MONTANA STATE FISH AND GAME DEPARTMENT

A Boy and His Dad

By Edgar A. Guest



*A boy and his dad on a fishing trip—
There is a glorious fellowship.
Father and son and the open sky
And the white clouds lazily drifting by,
And the laughing stream as it runs along
With the clicking reel like a martial song,
And the father teaching the youngster gay
How to land a fish in the sportsman's way.*

*I fancy I hear them talking there
In an open boat, and the speech is fair;
And the boy is learning the ways of men
From the finest man in his youthful ken.
Kings, to the youngster, cannot compare
With the gentle father who's with him there.
And the greatest mind of the human race
Not for one minute could take his place.*

*Which is happier, man or boy?
The soul of the father is steeped in joy,
For he's finding out, to his heart's delight,
That his son is fit for the future fight.
He is learning the glorious depths of him,
And the thoughts he thinks and his every whim.
And he shall discover when night comes on
How close he has grown to his little son.*

MONTANA WILD LIFE

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Streams Closed To Save Game Fish



T. N. Marlowe

THROUGH whole-hearted co-operation of Montana sportsmen, the State Fish and Game Commission has taken courageous steps to save the fishing in Montana, by closing all streams, with few exceptions, between November 1 and the opening of the regular season next May. Surveys made by attaches of the Commission reveal the startling fact that because of the extended dry sea-

son, the devastating forest fires and the consequent drying up of hundreds of creeks, thousands of fish are being landlocked and threatened with destruction. If winter fishing is allowed, the fish confined in pools and holes, as well as in the low lakes and streams, will be virtually slaughtered and the splendid angling made possible through constant restocking by the Commission will be ravished. If fishing is permitted to continue in landlocked pools, it means a setback of several years, hence the action by the Commission. On motion of Chairman Marlowe the spawn-taking stations of the state were also closed to fishing. Action, which will be found in the following minutes, featured the session at Helena September 26:

Those present were Chairman Thos. Marlowe, E. A. Wilson, J. L. Kelly and W. K. Moore, Commissioners; State Game Warden Hill; Field Assistants Treese and Schofield; Deputy Game Warden Hill; Senator Miles; and Dr. D. R. Crawford.

Mr. Hill read a telegram from the Miles City Rotary Club relative to the Miles City pond cultural station, and thanking the Commission for the work done there by them.

Mr. Hill presented a letter from the Big Horn County Rod and Gun Club, asking that Big Horn county be opened to Chinese pheasant shooting this season; and a letter from the Great Falls Gun Club, asking that Cascade county be opened to Hungarian partridge and Chinese pheasant shooting this season. Chairman Marlowe advised that he had a letter from the Izaak Walton League of Great Falls, making the same request for Cascade county. He also advised that this club requested that Cas-

cade county have an open season on female as well as on buck deer, and that he had written them that the Commission has no power to open the season on female deer. Mr. Hill read a petition from Lake county sportsmen, asking that their entire county be opened to Chinese pheasant and Hungarian partridge shooting. He explained that the sportsmen had circulated this petition just prior to the last meeting of the Commission and had not at that time been informed of the action of the Commission in opening a portion of

Lake county to the shooting of these birds. No action was taken relative to this petition, inasmuch as the matter had already been taken care of. Mr. Moore asked that Rosebud and Treasure counties also be opened to Chinese pheasant and Hungarian partridge shooting. Mr. Hill read a request from the Valier Rod and Gun Club, asking that Pondera county be opened to Hungarian partridge shooting.

On motion of Mr. Kelly the following counties were opened to the shooting of Chinese pheasants for 1929: Cascade, Treasure, Rosebud and Big Horn, and the following counties were opened to the shooting of Hungarian partridges for the season of 1929: Cascade, Treasure, Rosebud and Pondera.

The open season on these birds for 1929 begins with November 24 and ends with November 28, both dates inclusive. The bag limit is three birds, which may include three Hungarian partridges of either sex or three Chinese cocks or three in the aggregate, it being the intention of the Commission that the bag limit shall be but three birds per day, whether they be male Chinese pheasants or Hungarian partridges of either sex; and that no person shall have in his possession more than six of any such birds at any one time.

Mr. Marlowe read a letter from the Hamilton Sportsmen's Club, asking that the Commission change and extend the southern boundary of the portion of Ravalli county opened to Chinese pheasant and Hungarian partridge shooting. Inasmuch as this boundary had been suggested by the Daly interests, through which the Commission has received extensive cooperation, the matter was referred to Mr. Marlowe and Mr. Hill to investigate, at a hearing at Hamilton.

Mr. Marlowe presented another request from the Hamilton Club, asking that the open season on mountain goats be extended over a longer period. Mr. Marlowe was instructed to write the club that the open season on mountain goats is in the nature of an experiment and that the Commission feels that the open season on these animals should be short this year.

Senator Miles, brother of George Miles, owner of the Anderson hatchery at Emigrant, asked the attention of the Commission in a discussion of the Anderson hatchery and the purchase of the hatchery by the Fish and Game Department. The Commission questioned Dr. Crawford as to his report of his investigation of the hatchery. Dr. Crawford reported that a large volume

Antelope Protected

MONTANA sportsmen in Powder River county and other areas bordering on Wyoming are up in arms regarding the alleged slaughter of antelope during the early part of October. Sportsmen generally throughout the state have become somewhat confused over the situation. No complaints have been received by the State Fish and Game Department. There is no open season on antelope in Montana. They are protected as they have been for years. The Wyoming Commission, however, made provision for an open season on the little animals for three days in certain parts of that state and six days in others, commencing September 29.

The special permit costs non-residents \$50 and each hunter or party of two must be accompanied by a guide. It is possible that thoughtless Montana meat hunters have participated in the slaughter of the pets of the farmers. Their misdeeds are not countenanced by the State Commission. Complaints have been made for years to the State Department that Indians, regarded as wards of the federal government, have been killing antelope on reservations, particularly in the Cut Bank and other high line territory. The matter has been placed before federal officials. Because of the offenses against good sportsmanship being committed on Indian reservations, the problem is in the hands of federal officials.



of water is available; extensive development would be possible and an easy proposition; location from the standpoint of distribution of fish is good. His suggestion was that the Emigrant hatchery be abandoned, an attendant be kept at the Anderson hatchery, if purchased, and all work be concentrated at that hatchery. Mr. Schofield suggested using the Anderson hatchery in conjunction with the hatchery at Emigrant. Commissioner Wilson was requested to secure abstract to the property known as the Anderson site, in Park county, and submit it to Warden Hill for examination; that he ascertain the cost of moving the buildings from the Emigrant hatchery to the Anderson site; that he negotiate with Mr. Miles for a revised figure, Mr. Miles to retain and dispose of all fish now in the pond; and that he approximate the cost of constructing any necessary buildings, ditching, concrete work and cost of operating this plant when in operation.

Mr. Hill advised that at the last meeting of the Commission, Cow Creek, in Blaine county, had been closed to fishing. He had not published notice of this action until he received the sentiment of the Blaine county sportsmen relative to closing the stream. He was authorized to publish the order.

Mr. Hill advised that, according to the order of the Commission at the last meeting, he had written the Missoula Public Service Company relative to the installation of a fish ladder over the Bonner Dam, in the Missoula River. He read a letter from Judge W. M. Bickford in answer to his letter to the Public Service Company, in which Judge Bickford explained that a fish ladder over the dam would be impracticable due to the fact that it would be torn out every year during flood waters. On motion of Mr. Kelly the reply to Mr. Hill's request for the installation of a fish ladder at the Bonner Dam, Missoula River, was accepted.

Mr. Hill advised that he had received several complaints to the effect that the elk at the DuRand ranch are in a starving condition. On motion of Chairman Marlowe the secretary was asked to ascertain the names of the directors of the club or association owning the elk, and write them that the Commission is informed the elk are in a starving condition and that it is the opinion of the Commission that something should be done immediately to see that the elk get proper food.

The secretary read a letter from the Custer Rod and Gun Club, asking that the fish and game animal exhibit be shown at the Eastern Montana Fair next year. Mr. Marlowe advised that he had a similar request from Kalispell.

Mr. Hill read a letter from O. E. Stephel, leader of U. S. rodent control, asking for six Hungarian partridges so that he might make experiments as to whether they were susceptible to strichnine poisoning. Dr. Crawford stated he thought the California Department of Fish and Game had made such an investigation. Mr. Hill was requested to write to the proper officials of California to get their report on the matter of experiments carried on relative to giving poison to game birds. Deputy Warden Marshall was instructed to assist Mr. Stephel in trap-

Look Out! Blue Bills!

"The Melancholy Days have come
The saddest of the year."
So wrote the scribe. His "hunch" was
"bum."

He didn't hunt, I fear.
For he who "totes" a scatter gun
Looks to the fall for his best fun.

I love to snag the gamey bass,
Or struggle with a pike,
Or dive, or swim, or lay in grass,
Or take a good long hike;
But none of these can match the thrills
Of "Down!" "Mark North!" "Look Out!"
"Blue Bills!"

The gridiron sport gives me a "kick"
With forward pass or dash.
I soar to heights when John or Nick
Pounds out a home run smash.
But even these don't chill my spine
Like Redheads coming in a line.

The click of driver on the tee
Is music to my ear.
I like to see the oars swing free
And note the challenge cheer.
But stars seem friendly, troubles light,
When sitting by camp fires at night.

Oh, Supreme Ruler in the sky,
Who gave us lakes of blue,
Who taught the trout to take a fly,
Who bathes the world in dew,
Thy world is great, but of it all
Give me duck hunting in the fall.

ping six Hungarian partridges for experimental purposes and scientific research.

Mr. Hill asked the Commission for an opinion on the creation of a duck preserve at Baker Lake. Mr. Findlater, who owns acreage along this lake, had written asking for action of the Commission. Commissioner Moore reported that sentiment in the Baker district had not been entirely for the creation of this sanctuary. He said he had never received an answer to his letter to the railroad company that had created this lake as to whether they would consent to the creation of this sanctuary. Mr. Marlowe presented a petition from sportsmen in Baker objecting to this preserve. Secretary Hill was instructed to write to Mr. Findlater stating that there is an overwhelming objection to the creation of a preserve, and the Commission has dropped the matter.

Mr. Moore stated that he had not been able to find anything definite relative to the opening of the Little and Big Horn Rivers. This matter was tabled until a future meeting.

Mr. Hill advised that he had received letters from Harry Cosner, deputy game warden at Malta, and John Tressler, also of Malta, who seem to be exercised that Bowdoin Lake and surrounding water holes may be taken over for federal refuges. Mr. Marlowe advised that, according to his conversation with Paul Redington, chief of the Bureau of Biological Survey, it is not the intention of the federal government to take over natural bodies of water in this state. No action was taken relative to this matter.

Mr. Hill reported that on August 2 he had held a public hearing in Columbus, Montana, relative to the creation of a game preserve in the southern part of Stilwater county. At the hearing there was no one present who seemed to have any particular interest in the creation of such a preserve, while a number present strongly objected to such action. He read a letter from Merle L. Fagg of Billings, asking that this portion of Stillwater county be at least closed to deer hunting. The request for the creation of a game preserve in the southern part of Stillwater county was denied.

Mr. Hill read a report from Kenneth MacDonald of his construction work at the Lake Francis spawn-taking station. He advised that the work is well in hand. He stated that ninety pieces of redwood should be requisitioned. Mr. Moore advised he would order this wood from California.

The secretary read a letter from Philip N. Bean of Wolf Creek, asking that the country north of the North Fork of the Dearborn River be closed to hunting, due to the forest fires in the Twin Buttes game preserve. Nothing was done relative to this request, due to the fact that there is no certainty as to where the deer from the game preserve will find winter quarters.

Mr. Hill asked Mr. Schofield to make a report of the fish-taking operations at the Miles City pond cultural station. Mr. Schofield reported that the present method of getting water in this pond is not satisfactory. The pond has not an independent water supply and the water this year was very low, which caused a lack of food and loss of small fish through cannibalism. He also reported that the U. S. Bureau of Fisheries is doing the following constructive work at the station: Building a tank house and twelve tanks to hold the small fish; building a five-thousand gallon tank for water for the retaining tanks; purchasing a pump and motor for maintaining the right pond level, to be put in the Fort Keogh pump station; digging two wells and equipping them with pumps and gas engines, to furnish water for the retaining tanks; and putting in a drain ditch from the pond to the Milwaukee tracks. The Bureau of Fisheries suggested that the Department cooperate in this program by constructing one mile of transmission power line for the running of the pump at the wells; furnishing material for a three-room residence at the pond, the labor for which would be furnished by the bureau, in order to have a man at the station all the time; repairing the ditch from the river so that water could be pumped into it for the station; constructing a small auxiliary pond for perch, sunfish and other warm water fishes.

Mr. Schofield was instructed to construct a new ditch to provide an independent water supply for the Miles City pond cultural station, at an expense not to exceed \$700. Mr. Schofield was instructed to spend not to exceed \$1,000 for the material for the cottage at the Miles City pond cultural station, the cottage to be constructed and completed by men in the employ of the U. S. Bureau of Fisheries, without further expense to the Fish and Game Commission of this state.

The matter of constructing a one-mile transmission line was left with Mr. Moore for investigation.

Mr. Hill read telegrams from the Miles City Kiwanis, Commercial and Rotary Clubs, and the Custer Rod and Gun Club, thanking the Commission for work done at the Miles City station, and asking for increased improvements.

Mr. Hill read a requisition from J. W. Schofield for eggs for the eastern district for the next season. Dr. Treese advised that he could furnish the necessary eastern brook and loch leaven eggs, but the eastern and western divisions will need 200,000 Chinook salmon eggs. Secretary Hill was authorized to take up with other state departments of fish and game the proposition of securing 200,000 Chinook salmon eggs, and to trade for them or purchase them outright.

Mr. Marlowe read a letter from the United States Department of Fisheries, relative to the water conditions in the Miles City pond cultural station.

Mr. Hill read a letter, addressed to Mr. Marlowe, from E. R. Swart of Polson, asking that that portion of South Crow Creek which flows through his property in Lake county be closed to fishing for another year. Mr. Moore's motion prevailed that: We extend the present closed season on that portion of South Crow Creek in Lake county which flows through the property of E. R. Swart of Polson, description of which is: South half of southeast quarter of Section 10; north half of northeast quarter of Section 15, Township 20 North, Range 19, M. M., from December 31, 1929, through December 31, 1930.

Mr. Marlowe read a letter from Mr. Patton, president of the Dawson County Rod and Gun Club, in favor of a 15 duck limit per day, an early closed season on all streams, and the creation of Fox Lake as a duck sanctuary. Mr. Moore advised that it is necessary to consult the railroad before a sanctuary can be made of this lake. The matter of a creation of a duck sanctuary at Fox Lake was therefore tabled until the next meeting, for Mr. Moore's further consideration.

Mr. Marlowe advised that the Somers Lumber Company plans to begin operations cutting timber around Lake Mary Ronan. He suggested that the Commission take up this matter with the proper officials, who might leave a strip of timber around the lake for water supply and who might be induced to not dump the logs into the lake, thereby saving the fish. Mr. Marlowe was authorized to take up this matter with officials of the company.

After discussion as to the merits and demerits of the Grebe or hell-diver, Dr. Crawford explained that they are instrumental in spreading diseases among fish. On motion of Commissioner Moore: "As far as the Montana State Fish and Game Commission is concerned, the Grebe or hell-driver be classed as a predatory bird in Montana, inasmuch as it has been proven that the Grebe is instrumental in spreading disease among our fish."

Mr. Marlowe presented a letter from the Stillwater Rod and Gun Club ask-

HUNGARIANS

Shrill and shy from the dusk they cry,
Faintly from over the hill;
Out of the gray where the shadows lie,
Out of the gold where sheaves are high,
Covey to covey, call and reply,
Plaintively, shy and shrill.

ing, and the Commission approved, closing the streams of the state at an early date, but leaving open the Yellowstone River. They also stated that Bad Canyon Creek has been closed by the Commission to fishing because it was thought to be a feeder creek to the Stillwater, but it is not. They asked that the stream be opened to fishing inasmuch as the fish that are in it are frozen each year. The commission rescinded the order closing Bad Canyon Creek, in Stillwater county, and directed that it be open to fishing during the open season.

Mr. Marlowe read a letter from the Kalispell Rod and Gun Club, asking that hay be delivered to that district to take care of deer in the territory burned over by forest fires, inasmuch as very little winter forage is left, and Mr. Marlowe was authorized to communicate with Ward Nichols of the Kalispell Rod and Gun Club to make inquiry as to the approximate amount of hay that will be required and possibly enter into an agreement whereby the Department and the club shall divide the expense of providing for these animals.

Mr. Marlowe advised that he had a telegram from the Hamilton Sportsmen's Club, asking that the West Fork of the Bitter Root be closed to deer hunting until October 1, 1929, due to the fact that the forest fires had run the deer into the open. Mr. Marlowe advised he had answered the telegram that it would take too long to make correct publication for such an order, and it would be impossible to close the district for any length of time before October 1.

Mr. Kelly reported that he had advertised for bids for the construction of a residence for the superintendent of the state game farm at Warm Springs; that he had received only two bids; and that he had let the contract to Theodore Eck of Anaconda, Montana, for \$5,891. This bid includes plumbing and wiring. He deposited with the secretary a cashier's check for \$640, given by Mr. Eck, and also filed a contract for the work with the Department for filing. The action of Commissioner Kelly, with reference to the letting of the contract for building of the residence at Warm Springs, was ratified and he was thanked for doing this work.

Mr. Marlowe stated he had written letters to the several sportsmen's clubs throughout the state for their opinions on closing the fishing streams and lakes in the state to fishing before the regular closed season. He received 33 inquiries, 27 of which were affirmative, two negative, and four with exceptions. The following motion of Mr. Marlowe

was then approved: "Whereas, on account of the unprecedented drought which has prevailed in most, if not all, sections of the state during the past spring and summer and the present fall, the fishing streams of the state are now lower than they have been in years; and whereas, with the water so low in said streams, there is great danger that said streams will be unduly depleted of the game fish therein unless fishing therein is checked and prohibited; and whereas, the game fish of our state, on account of the extreme low waters in our fishing streams, are now threatened with undue depletion, I therefore move that the Commission, by virtue of the authority vested in it under the laws of this state, declare a closed season on all game fish in all the streams of the state, excepting the Kootenai River; the Yaak River, from the Sylvanite Ranger Station to the Kootenai River; the Fisher River, from the junction with West Fisher River to the Kootenai River; all that portion of Flathead River below Bad Rock Canyon, Montana, and the Clark's Fork River of the Columbia River, a continuation of the Flathead River; the Missouri River; the Yellowstone River; the Madison River, from the foot bridge that goes across from the game warden's cabin below the Hebgen Dam, to where it empties into the Missouri River; the Big Horn River below the dam above St. Xavier; and the Little Big Horn River, below the dam at the Crow Agency in Big Horn county; the closed season in said streams to begin with the first day of November, 1929, and end with the twentieth day of May, 1930, both dates inclusive; and that legal notice or notices of the ruling of the Commission in this respect be published by the secretary of the Commission in the necessary papers."

The Commission then approved the following motion by Mr. Marlowe: "Whereas, on account of the conditions existing, the Commission has this day closed most of the streams of the state to fishing; and whereas, it is imperative that the spawntaking places in the state be protected for the purpose of taking spawn therefrom, I move that the following spawntaking stations within the state of Montana be closed to fishing, to-wit: Georgetown Lake, in Granite and Deer Lodge counties; Lake Mary Ronan, in Lake county; Lake Francis, in Pondera county; and also Hebgen Lake, in Gallatin county; the closed season in said lakes to begin with the first day of November, 1929, and end with the twentieth day of May, 1930, both dates inclusive; and that legal notice or notices of the ruling of the Commission in this respect be published by the secretary of the Commission in the necessary papers throughout the state."

Mr. Hill read a request from the Deer Lodge Anglers' Club, to open Brown's Lake to fishing on September 15 instead of September 30, and it was denied.

Mr. Hill read a request from T. E. Day, foreman of the Ovando fish hatchery, that Jones Lake be opened to fishing in the winter months, and it was denied.

Fish Hatcheries of Montana

By D. R. CRAWFORD—Official Report Covering June 24 to September 24, 1929

MONTANA'S fish hatcheries—14 of them—must be depended upon next season to supply an unusual number of fingerlings with which to stock depleted streams and lakes which have been hard hit by the extended dry spell and the forest fires of 1929, hence the State Fish and Game Commission employed D. R. Crawford, professor and piscatorial expert of the Department of Fisheries of the University of Washington at Seattle, to make a survey and report. The findings of the expert cover his investigations between June 24 and September 21, and have been filed with Robert H. Hill, State Fish and Game Warden, as secretary of the State Commission. In publication of findings technical material has been eliminated for the convenience of the reader. Professor Crawford's findings follow:

This report deals with conditions found at trout hatcheries of the Montana Fish and Game Commission during the summer of 1929. The writer was called upon to make observations with regard to improvements in equipment or methods so that the general efficiency of operation could be increased. Studies accordingly were made of the water supplies at the different hatcheries, methods of feeding were observed, and several special studies were made to find out the causes of losses. In addition to this, rearing pond sites were observed and suggestions offered with regard to selection and stocking. Information concerning the enlargement of the hatchery at Big Timber was secured, which has been given in a special report to the superintendent of hatcheries.

The observations in detail are as follows:

Rearing Ponds at Post Creek

The Commission had some native trout in privately owned ponds at Post Creek. It was reported that these trout were dying in large numbers. Preliminary observations indicated that the fish were infested with the parasite known as *Otomitis*, which is a very widespread disease among trout. Excessive growths of green algae suggested that there was lack of aeration of the water. A study of the water supply quickly showed that the temperature range was from 59 to 69 degrees in the course of about twelve hours. The maximum temperature usually was reached about two or three o'clock in the afternoon and was maintained until after sundown. Temperature observations at different places in the same pond indicated that the change of water in the pond was very slow and that the flow of water was not sufficient to prevent a rapid rise in temperature.

It seemed obvious that if the flow of water could be increased and the temperature lowered the disease could be checked by inhibiting the rapid growth of the parasites. Accordingly more

water was turned into the ponds which resulted in lowering the temperature range three or four degrees and in giving better circulation to the water through the ponds. A noticeable decrease in the death rate was observed within a week. It was suggested that these ponds were not suitable for the rearing of native trout, but that conditions were good for rainbows.

The problem of dealing with excessive growths of green algae was taken up and it is believed that the use of rock salt will inhibit the growth of algae to a great extent and make it possible to control such growth while young fish are in the pond. This appears to be the only safe way. The use of copper sulphate is very dangerous because the amount required to kill the algae is very nearly the amount that will kill the fish. In the ponds at Post Creek a cake of stock salt was hung in a sack under the stream of water flowing into one of the ponds so that as the salt dissolved it would be circulated through the pond. After about 200 pounds of salt had been used it was noticed that the algae turned yellow and that the growth seemed to be checked. The two ponds treated with salt contain about an acre of water four feet deep. The writer did not stay long enough to observe whether the algae was completely destroyed, but later information seemed to indicate that it probably was.

These ponds were taken as an example of earth ponds where the water enters at a low head and where aeration is apt to be low, especially during warm weather. Situations like this are not good for native trout. Naturally, the native trout is a cold water fish, although it can withstand rather high temperatures for short periods of time. At these higher temperatures the rate of growth is rapid and if food conditions are good the trout reach a large size in a short time, but the danger from disease is much greater.

Missoula Hatchery

Originally, the Missoula hatchery probably had an adequate water supply, but use of Rattlesnake Creek for the city water supply has reduced the quantity available to the hatchery so that now conditions there are not good. Observations of the temperature of the water in July showed that the water is dangerously warm since it reaches and maintains during the day a temperature range of 60 to 69 degrees.

FISHING

A swirling stream 'neath sun-kissed trees,
A casting rod and boots to knees,
A briar pipe and an old slouch hat—
You couldn't wish for more than that.

The rearing ponds were found to be in poor condition. If ponds are necessary at this hatchery it is probable that the situation can not be improved since no better location for them seems to be possible. The inlets to the ponds could be greatly improved to provide better control of the water supply and no doubt concrete bottoms would greatly facilitate cleaning. Under the present conditions the ponds are very hard to clean and the danger from disease is considerable, unless lime is used to destroy the organic matter after the fish are removed.

In addition to the water from the creek, water is pumped from a well. While this may be adequate under ordinary conditions, it is suggested that this additional cost seems rather high since the capacity of the hatchery is not great. Under the best existing conditions this hatchery probably should not carry more than 1,500,000 trout eggs.

Unless there are very strong reasons which are not now apparent, this hatchery ought to be abandoned because of the high cost of operation, which seems unjustifiable since it is surrounded with hatcheries of equal or greater capacity at convenient working distances in this region.

Anaconda Hatchery

This hatchery in many respects is the best equipped but it has an insufficient water supply to properly operate the hatchery and the rearing ponds at the same time. Observations this summer indicate that the hatchery was somewhat overcrowded for the best results. The quantity of water never seemed to be abundant although the pan aerators in use have made it possible to carry more fish in the troughs than would otherwise have been possible. During September, however, it was seen that there were too many fish for the water supply and the death rate was higher than it should have been. Ordinarily early distribution of the fish has prevented large losses, but the unusually long period of dry weather this year made it impossible to distribute the fish in time to prevent heavy losses.

The rearing ponds at this hatchery are of a good type and easily handled. This short, shallow type is more efficient than very long ponds because it is possible to get better circulation of water and to feed the fish with less loss of food. The risk from disease is reduced because such ponds are easily cleaned.

It is evident that the chief requirement at this hatchery is to secure more water as soon as possible. It is probable that the safe load of fish is not more than 2,000,000, the margin of safety above this number being so small that any adverse condition may result in heavy losses. As an eyeing station the water supply is sufficient for more

trout, although native trout also grow well. The springs supplying the hatchery did not materially decrease in volume during the summer.

The rearing ponds are in fair condition but are inadequate to hold many fish. It is not desirable to construct new ponds at this hatchery because a very much better pond system could be made by acquiring the Anderson place near Emigrant. There is a great abundance of water at this place and plenty of room for an extensive development of ponds to hold fish at any time and to any desired size.

Emigrant Hatchery

This hatchery is an auxiliary to Big Timber and under the present conditions does not have any apparent value. The eggs ordinarily handled at this hatchery could much better be handled at the hatchery at Big Timber. The water supply at Emigrant is inadequate for the number of eggs usually carried and the margins of safety are so small that there is always risk of a total loss of eggs or fish. The ponds ought to be abandoned.

Red Lodge Hatchery

This is another auxiliary to Big Timber. The water supply is taken from the city water system through a four-inch pipe. Under ordinary conditions the amount of water is adequate for the number of eggs usually carried, but there is always the danger that the city might need all of its water to meet some emergency. The hatchery location is now fairly good, but under modern working conditions the eggs and fish could be handled from the Big Timber hatchery. This is advisable since the roads to Red Lodge are difficult and it is hard to see why such a long trip should be made with eggs and then repeated to plant the fish when the fish required to stock the streams in this region could be carried directly from Big Timber to the places where they are to be planted. It is recommended that this hatchery be abandoned for purposes of economy and efficiency in operation and the eggs and fish kept at Big Timber.

Lewistown Hatchery

This hatchery has an abundant water supply, but there are few places in this region to plant fish. The territory served by this hatchery is overlapped by Big Timber and Great Falls and the hatchery could be abandoned. This, however, may not be a good scheme because a hatchery with such a good water supply may be required in the development of a large number of eggs from Lake Francis. The rearing ponds are supplied with plenty of water but are of rather small size. It appears to be impossible to increase the number of rearing ponds without undue expense.

Great Falls Hatchery

This hatchery serves a wide territory and should be made one of the best. Unfortunately, it has acquired a bad reputation for heavy losses. The chief difficulties are mechanical and can be easily overcome. The original design was poor. The water supply is deficient in oxygen as it leaves the spring and there is little chance of aeration before the water reaches the

NO RELIGION

He doesn't worship in my church;
He doesn't seem to pray.
On Sunday he goes out to fish—
That's how he spends his day.
But James and John were fishermen,
Simon and Andrew, too.
And Jesus came and called to them—
Had work for them to do.
So, though he doesn't go to church,
Nor lift his voice to pray,
Perhaps the Lord will call to him
By some cool stream today.
Perhaps when he tramps up a stream,
Whipping the waters cold,
The Lord is just as near to him
As to those men of old.

hatching troughs. It is suggested that raising the head trough in the hatchery and the use of pan aerators will correct the troubles due to lack of oxygen.

Water is pumped from the spring to a tank in front of the hatchery by a pump driven by an electric motor.

There are two rearing ponds each about 108 feet long with wooden sides and cement bottoms. The water supply is carried in 10-inch pipes leading from a sump which receives the water directly from the spring. The only control of this water is to brace some boards over the ends of the pipes where they enter the ponds. The only aeration of the water is provided by the overflow from the tank. The fish were observed to grow well in these ponds but they are too long for convenience and much time is wasted in cleaning them out on this account. A much more effective pond system could be developed by good engineering. This not only would greatly add to the value of this hatchery but would add to the looks of the place.

The size of the territory served and the general interest of the public in this hatchery justify the additional expenditures necessary to bring the equipment to the highest level. The tank now in use should be replaced by a larger one which could provide a greater amount of water in case of pump failure and also provide for aeration of the water in the ponds. The present mode of ponds should be replaced by a good system of concrete ponds.

Observations on Pond Sites

Numerous rearing pond sites were observed. The general policy of putting young fish out in ponds to take advantage of the natural food is good. This relieves the hatcheries of some of the work of caring for the fish and also leaves space in the hatchery ponds which is often badly needed.

There have been many requests from people for members of the hatchery force to look over proposed pond sites and much time has been spent in traveling about to places which were quite obviously unsuitable. It is suggested that much time and effort could be saved if interested parties could be provided with general specifications of suitable ponds. The best ponds now in use appear to have the following characteristics: They are usually not less than half an acre in area; they can be completely drained; they contain an abundance of aquatic vegetation which supports plenty of natural food; they

drain into some important stream which is thus stocked when the fish are liberated; they are accessible to some means of transportation such as roads or railroads; they are of moderate depth and supplied with a good flow of cool water.

In general, it is not advisable to put more than 15,000 fish into an acre of water. The depth of the pond is not as important as a good circulation of water. The depth of the pond is of course an asset. Clear water yields a greater natural food supply than slightly turbid water and grass and small brush growing around the margins of a pond are important because many small in- than this number of eggs and if the fish are distributed early a larger load can be carried than otherwise.

Several times small fish have entered the water pipe and clogged the pipe supplying a trough with the result that many fish were lost. It is obvious that this condition should be prevented.

Rock Creek Hatchery

This hatchery is really auxiliary to the Anaconda hatchery and is useful chiefly in providing additional water and space for the number of eggs required for this region. The building is poorly constructed and the site is very poor, but the water apparently is of good quality and the hatchery is strategically located with respect to the general scheme of distribution. Since this is only a temporary hatchery it probably would not pay to do any more than keep it in repair so that it could operate during the required time.

Big Timber Hatchery

This hatchery has a really adequate water supply. Conditions are so favorable that a special report to the superintendent of hatcheries was made recommending that this hatchery be enlarged from 34 troughs to 64 troughs. The water appears to be the best noted during these investigations for rainbow seets which drop into the water are found in such places. There are thus many factors which modify the number of fish which a pond will support. Water which is above 58 degrees during the day should be regarded as unsuitable for natives, but good for rainbows or eastern brook. The best time to look for pond sites is during extreme dry weather.

Observations on Feeding

There was considerable difficulty and heavy losses were incurred with the feeding of various dried foods. Studies of feeding were made at Great Falls. It was observed that the fish were dying in large numbers and had not grown to any extent. The food was examined and found to consist of a mixture of fish meal and salmon eggs. The salmon eggs were sifted out in preparing the food for the fish so that the remaining food consisted entirely of fish meal. Experiments were made to see how soon water would be absorbed by this material and it was found to absorb about 80 per cent of its bulk over night. Part of the difficulty apparently was due to the slow absorption of water which made the food highly indigestible. In this form the fish could not assimilate it.

MONTANA STATE FISH AND GAME COMMISSION

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Joseph L. Kelly, Anaconda.
W. K. Moore, Billings.
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CONSERVATION PATRIOTIC DUTY

By CHARLES G. DAWES,
U. S. Ambassador to Great Britain.

THE conservation movement in the United States today constitutes this country's finest demonstration of pure idealism—of unselfish patriotism. Those who adhere to it solely for the love of out-of-doors, who comprehend their duty only in terms of planting a tree, purifying a stream, protecting a bird's nest, or otherwise making the out-of-doors a little cleaner, a little more beautiful, and a little more alive with the pulse of nature, have justification enough for their work and reward enough in their accomplishments. On economic grounds alone we may call upon the self-interest of our people and justify all the time and the energy that is expended in a conservative movement."

Nero spent \$150,000 on flowers for one banquet.

SEA GULLS RESCUE FARMERS AGAIN

MANY years ago grasshoppers were devastating the grain crops of the Utah Mormon pioneers; if something wasn't done soon the natives of the state would be facing starvation. All other means failing, prayer was resorted to. The Mormon Church as a body prayed for deliverance from the grasshoppers.

As the story goes, uncounted numbers of sea gulls, formerly unknown to the inland, came flocking to the fields as the good citizens prayed, and soon devoured all the grasshoppers.

A beautiful monument in commemoration of the sea gull was erected in Temple Square, in Salt Lake City.

Now comes a story from Salt Lake City to the effect that the sea gull has come to the rescue of the farmers again. This time the large birds are saving the crops from field mice. The rodent had become a menace in the vicinity of the American Falls reservoir on the Snake River in southern Idaho.

The Associated Press story in the latter incident said:

"A. E. McClymounds, superintendent of the agricultural experiment station at Aberdeen, Idaho, has discovered that the gulls, which have taken up their homes in increasing numbers on the artificial lake there, are developing an appetite for the field pests.

"The birds, which nest in immense flocks on the islands of Great Salt Lake, may be seen each spring far inland, closely following farmers and foraging newly plowed fields for bugs and worms."

STUDY OF PHEASANT FOOD INTERESTING

CONTENTS of the digestive systems of more than 100 Chinese ringnecked pheasants have been analyzed at South Dakota State College, in connection with an investigation to determine the relation of the game birds to South Dakota agriculture, according to H. C. Severin, professor of zoology and entomology at State College, who has supervision of the project.

Some of the birds already examined include the following, as set out in the report:

One stricken and killed by a car when eating corn in the middle of a graveled highway near Mitchell. Its gizzard and crop contained corn almost exclusively, although 372 fine stones and 5 yellow-foxtail and 4 wild-buckwheat weed seeds were also discovered, as well as a few insect parts.

Another was taken from a corn field near Huron. The corn was approximately six inches high. The crop contents of this bird were: 61 kernels of unsprouted corn, 21 of oats, 6 barley, 1 wheat, 1 spider and 38 cutworms. The gizzard contained 4 kernels of unsprouted corn, 25 cutworms, 5 oats, 1 barley, 1 yellow-foxtail weed seed and 357 small stones. The corn eaten by this bird was undoubtedly waste.

The crop of another bird, taken from a small-grain field near Mitchell early in the spring, when snow was on the ground, contained 258 kernels of oats, 146 of barley, 17 wheat, 75 sweet clover, 1,532 yellow-foxtail weed seeds, 5 Russian thistle, 16 wild buckwheat, 2 lambs quarters, 48 green foxtail and 2,260 stones, or less than about one-fifth of a teaspoonful. The gizzard contained 1,886 stones, 3 oats, 5 barley, 23 sweet clover, 94 yellow-foxtail, 1 wild buckwheat, 2 green foxtail and 9 wild rose.

Above all things, order, and distribution.

PHEASANT REARING IN CALIFORNIA

AFTER experimenting with propagation of ringnecked pheasants for a number of years, California abandoned pheasant rearing for a period of about ten years. Three years ago a game farm was again established which has been operated with signal success. The first year, 1926, was occupied chiefly in construction and getting the farm in operation. The two following years approximately 7,000 pheasants were reared each year and distributed throughout the entire length of the state stocking suitable areas.

The California game farm is located at Yountville in Napa county, north of San Francisco, and is in charge of August Bade, formerly of the Fish and Game Department of the State of Washington.

Experiments have been carried on in breeding the California valley quail, which have been encouraging in their results. Experiments are also being made with the Bamboo partridge of China and the Tinamou of South America.

THE FORD THRILL

HER lips quivered as they approached mine. My whole frame trembled as I looked in her eyes. Her body shook with intensity as our lips met, and I could feel my chest heaving, my chin vibrating, and my body shuddering as I held her to me. The moral of all this is: Never kiss them in a Ford with the motor going.

GAME CENSUS BY AIRPLANE

ALASKA is taking a big game census by airplane. In one flight over the Big Delta region 500 caribou and nine moose were counted. Near the Toklat River 20 moose were seen. The machine frightened the caribou but did not disturb the moose.

HOW TO GROW QUAIL

MONTANA sportsmen hope that before many years the state will be stocked with quail. There are a few now in the Gallatin. In telling how the country boy or girl can grow quail, Aldo Leopold, the naturalist, observes: "Most people think that growing game means putting them in a pen and taking care of them like chickens." He does not recommend this method, because he believes it will be more interesting, much cheaper, require less care and involve less risk of loss, to try to fix up the farm so the game will grow itself. The effort is doubtless worth while as a dozen pairs of quail will increase to over 3,000 in three years, under ideal conditions, according to Mr. Leopold. He lays out a formula, along the following lines:

"Protection. Do away with all hunting cats, kill the sharp-shinned hawks, reduce the skunks and nesting crows if abundant, and, if you can, keep down the foxes.

"Cover and Food. Any farm has plenty of cover and food in summer and fall. It is the winter and spring cover which counts. Imagine yourself to be a quail in February, with a cat or fox on your trail. Where would you hide? What would you eat? Arbor day is the right time to begin providing winter cover and food for quail."

Mr. Leopold believes that cover and food may be insured by leaving the grassy swamps and the weedy and bushy fence rows and the thickets alone, and by the growing of grapevines and other plants for winter cover so that there will be at least one refuge on every 40 acres. Each cover should be at least as much ground as is occupied by an ordinary house, he says. He advises locating the refuge covers on the edge of the woods or in the open, which, he says, are better for quail than the deep woods. Each refuge should have a few wild grapevines and the more these run over the bushes and form tangles the better it is for the quail.

Boys and girls who wish to grow quail are further advised to thicken up the refuge covers by planting in each of them groups of evergreen and locust trees. Feeding the quails in severe weather may be accomplished by hanging ears of corn under the grape tangles. They should be tied high enough so that they will be out of reach of rabbits. "If you can build one refuge cover each year you will soon have lots of quail. They will benefit the farm crops," says Mr. Leopold, "and furnish you enough music and pleasure to amply repay your trouble."

REFUGES BY PRIVATE ENTERPRISE

THE fact that sanctuary is one of the first essentials to maintaining a supply of game and bird life is coming to be generally realized. Creation of refuges and sanctuaries by state and federal authority is being supplemented by individuals, as advocated by the American Game Protective Association. Many owners of large tracts of land are establishing refuges on their properties and in this way effectively supplementing the work of the government. Throughout the southern states large tracts of land are being bought and segregated as shooting preserves. Coincident with this is the establishment of sanctuaries where game will be fostered and preserved and encouraged to increase.

One outstanding example is the creation of a 60,000-acre game and fish preserve on Saint Simons Island, off the coast of Georgia, by Howard E. Coffin, the well known automobile manufacturer of Detroit. Mr. Coffin is also the owner of Sapelo Island which he maintains as his personal estate.

It is Mr. Coffin's intention to create on Saint Simons Island a game preserve which will be without a superior in the country. Breeding shelter and protection will be provided for all the native species of game and bird life, including deer, wild turkey, Bob White quail, waterfowl, and experiments will be made in the introduction of the pheasants, peafowl, and other exotic species.

The area selected for the sanctuary lies 27 miles south of the Sea Island Yacht Club on Saint Simons Island on the inland passage from New York to Florida. The entire tract is virtually a virgin wilderness. There are majestic pine groves interspersed with tangled thickets of palmetto and scrub oak. There are also numerous open spots which are being planted with game food. It is Mr. Coffin's intention to foster the increase of game in this sanctuary so that surrounding areas will be amply supplied for legitimate shooting purposes.

BOYS AFTER MAGPIE PESTS

TRAMPING over the same trails the Blackfoot Indian trod, boys are leaving the footprints of progress in the age-old dust around Blackfoot, Idaho. These youngsters have brought the magpie under control, much to the delight of farmers, sheepmen and cattlemen of the district. The Bingham County Fish and Game Association of Blackfoot sponsors a predatory bird campaign each year. Through the leadership of A. T. Springer contests among the youngsters have been held during the last two years. In 1928 the association paid a bounty of one cent on magpie heads and eggs; 2,281 were brought in. The spring of this year the boys, vying with each other for the increased bounty of two cents each, brought in 10,154 heads and eggs! The campaign has also instilled the spirit of game protection among the boys who are becoming enthusiastic conservationists. More than 100 miles of the Snake River Valley are covered by this campaign.

GEESE

GESE is a low, heavy set bird which is most meat and feathers. His head sits on one end and he sits on the other. Geese can't sing much on account of the dampness of the moisture. He ain't got no between-his-toes and he's got a balloon in his stummick to keep him from sinking. Some geese when they get big has curls on their tails and is called ganders. Ganders don't have to sit and hatch but just eat and loaf and go swimming. If I was a goose I'd rather be a gander.

WOODCOCK SUPPLY IS GOOD

WORD comes from Harold Sheldon, chief game warden for the United States Department of Agriculture, that there will be plenty of native woodcock in Maine to provide good hunting there in the fall. Woodcock migrate to the south at the approach of freezing weather and many of them follow the coast line in their migratory flights. The woodcock does not migrate like many other migratory birds in large flocks, still when the flight is at its height it is not unusual to find a dozen or more of these birds in one small cover. The woodcock flies during the night and rests and feeds during the day, preferably on a birch-covered slope not far distant from an alder run, resting on the shady slopes after feeding in the runs. Angle worms are the favorite food of the woodcock and they secure the wrigglers by boring in the soft ground with their bills which average some three inches in length. The meat of the woodcock differs from that of most upland game birds in that it is dark in color and it also has a particular flavor which makes it sought by epicures. The birds lay well to a dog and are an easy mark to the experienced woodcock hunter.

SUCCESS NO ACCIDENT

NO man becomes great by accident. A man gets what he pays for, in character, in work, in energy. There are few really fine things which he can not get if he is willing to pay the price. Men fail, as a rule, because they are not willing to pay the price of the things they want. They are not willing to work hard enough, to prepare thoroughly enough, to put themselves heartily into what they are doing.

THE PERMANENT STOCK

WHAT can be said, off-hand, about the numbers of game ducks and geese which constitute our permanent investment? asks John C. Phillips, writing in "An American Sportsman's Bag." We can, at the present, arrive at this figure only by an arbitrary guess. It can not be less than from 75 to 100 million birds, judging by the numbers which we kill annually without greatly affecting the stock. This estimate does not count the marine ducks, such as eiders, scoters and mergansers. In terms of actual meat value this sum represents \$150,000,000 or thereabout. But directly dependent upon this immense reserve of wild life we must include the industries of the gun and ammunition people, representing gross sales approximating \$45,000,000 and in addition all interrelated commercial enterprises having to do with duck hunting and sporting paraphernalia. If to complete the picture of dependency we add to all of this the enormous recreational value which our million or two million duck hunters expend and reap from their outing, we begin to visualize some conception of the cash value of our waterfowl. It sounds big, this figure of 100 million birds, but compared to our increasing population and its access to game resources through accelerated movability, it is actually small. Not over one per capita in actual breeding stock.

Thrice Welcome Guests

By EVA AMMEN, Missoula, Montana

THOUGH Hungarian partridges, since their introduction some years ago, have become plentiful in Montana, one scarcely expects to entertain them in one's front yard. When a covey of a dozen birds, therefore, was found breakfasting on a lawn on the outskirts of the town of Missoula, the surprise of the owners of the property quite equaled their pleasure.

An unusually heavy snowfall and extreme cold had made accustomed feeding grounds unavailable, and forced the birds to look elsewhere for food. They were digging and scratching around mountain ash trees and a tall birch, where they found berries and seeds overlooked by the waxwings that visited the trees earlier in the season. The failure of their supplies had evidently been recent, for they were as round and fat as butter balls.

Several days later they came back in the evening, wearing a "lean and hungry" look. On this second visit there were but ten of them; and as the flock consisted of ten only thereafter, it seems probable that the missing two had fallen prey to some starved hawk or coyote.

Down into the snow went the covey, so deep that nothing but their brown backs were visible below the level, and no doubt they found chickweed as well as berries. They worked hard for what they got and at this point their delighted hosts decided to play Providence, and made it their business thereafter to see that the birds' table was bountifully supplied. These efforts to please were well rewarded, for the partridges became daily visitors. Their dinner hour was 6:15 sharp. They arrived on time—walking as quietly and politely through the open front gate as well-bred people approaching a dinner table—bringing their appetites with them.

Very soon after Providence took over the job their little bodies resumed their original round appearance, cracked wheat being evidently for them a balanced ration.

They made themselves unobtrusively at home on the lawn, but at the lightest footfall outside, stood at attention and were gone before one could say "Jack Robinson!"

On occasion, having eaten undisturbed, they played a game which their entertainers called "tag," running about over the snow with raised wings, first one and then another taking up the chase, unaware of the amused and interested eyes behind the window panes; but just before dark, rising in a body, they flew away, vanishing like little ghosts into the shadowy dusk of the surrounding prairie.

Perdix perdix, the Hungarian partridge, is the common gray partridge of Europe, known as the "gray legged partridge." It was introduced into Montana in 1921 by the Montana State

Feathered Foxes

FOR the first time since Hungarian partridges were introduced in Montana, sportsmen will be privileged to enjoy a short open season on the feathered foxes of the field November 24-28, inclusive. The accompanying article was prepared by Miss Eva Ammen, who is associated with the Forest Service at Missoula and has a delightful home with her sister near the outskirts of the city of Missoula. The article in which she tells her interesting experiences with the Huns has been given national circulation by publication in *THE FLOWER GROWER*.

Fish and Game Commission, and has done wonderfully well here, being very prolific, and hardy to a remarkable degree. For these reasons it is considered one of the best game birds in the state.

During the winter Hungarians flock together for protection against the cold, feeding on weeds and about straw stacks, and burrowing in the snow at night. They do well at high altitudes and withstand admirably extreme cold, where the climate is somewhat dry.

Indeed, these high wide valleys wedged in among Montana's blue mountains make an ideal place for them to raise families, of which father and mother are most solicitous guardians; though it seems probable, as has been suggested, that the determining factor in their success is neither altitude nor dryness of the atmosphere, but freedom from enemies in any considerable numbers to prey upon them. Jack rabbits

and gophers, their neighbors, are vegetarians, and coyotes, owls and hawks, which haunt the slopes of the wooded hills, rarely come out in the open.

These partridges are essentially ground birds, fly only short distances, but use their wings, run and jump for exercise.

Authorities seem to agree that they begin to mate late in January, but do not nest until about the first week in April. They raise two, and sometimes three, broods a year.

The bird is attractive in appearance; its predominant color gray with considerable brown on back and wings, and markings somewhat similar to those of the Bob White of the southern states—tail quite short, and size about that of a pigeon.

Opinions differ as to the ease with which sex may be determined. Some authorities state that a dark shield or "horseshoe" on the breast distinguishes the male; others, however, assert that this is not an invariable rule, as the horseshoe is sometimes present on the hen, particularly in the case of old birds. There are other characteristics that differentiate the cock, such as a slightly larger and more erect head, or a more ruddy color of wings and back.

CEDAR KEYS REFUGE ESTABLISHED IN FLORIDA

PRESIDENT HOOVER, by recent executive order, has set aside, as a refuge and breeding ground for birds, Snake Key, Dead Man or Bird Key, and North Key, in the island group known as Cedar Keys, off the west coast of Levy county, Florida, west of Waccassassee Bay. The refuge will be known as the Cedar Keys Bird Refuge and will be administered by the Bureau of Biological Survey of the United States Department of Agriculture.

The islands in the new reservation serve as important nesting and wintering grounds for aquatic birds, including several species of herons, pelicans, and corcorants, some of which are becoming greatly depleted in numbers.

It is unlawful within the refuge to hunt, trap, capture, wilfully disturb, or kill any wild animal or bird, or to take or destroy the eggs of any wild bird; to cut or burn any timber, underbrush, grass, or other natural growth; wilfully to leave or suffer fire to burn unattended near any timber or other inflammable material; to leave a fire near any forest or timber; or wilfully to molest, injure, or destroy any property of the United States.

DEPTH OF GENEROSITY

A Scot was playing a round of golf with his daughter.

"Maggie," he said, "is today your birthday? Weel, then, I'll gie ye this hole."



THE HUNGARIAN
Feathered Fox of the Fields

Cigarettes Cause Forest Fires

HOT, dry weather in many parts of the country the past summer brought about the most dangerous fire situation of the year, according to Assistant U. S. Chief Forester E. A. Sherman. The worst of these fires occurred in California, the Pacific Northwest, the Inland Empire region, and in Minnesota and Wisconsin. A number of them were caused by carelessness with cigarettes.

According to the U. S. Bureau of Standards, the property loss from fire attributable to smoking is about \$45,000,000 a year, and this does not include forest fire damage, which in 1927 amounted to more than \$6,000,000, nor all the loss from grain field fires started by smoking, for which separate figures are not available. More than 30,000 fires are estimated to have been caused by smokers in 1927. In an effort to reduce the number of fires caused by smokers, smoking is prohibited on extensive areas of national forest land except at improved camp grounds and places of habitation.

"Some of the progressive cigarette manufacturers are becoming interested in the problem of reducing cigarette fire losses," said Mr. Sherman. "Investigations by the Bureau of Standards on possible methods of fireproofing the tips of cigarettes are receiving the manufacturers' attention. The Forest Service is cooperating with the manufacturers in the development of a plan for educational work to induce greater care on the part of smokers. By including cautionary notices in cigarette packages and possibly on cigarettes themselves it may be possible to reach millions of smokers with direct warnings."

Mr. Sherman emphasized the fact that "Cigarettes and pipe ashes should be pressed out and discarded only in unquestionably safe places. Matches should be broken in two before they are thrown away. Every automobile should be equipped with ash receivers for both front and rear seats, as many fires are caused by burning tobacco or matches thrown from cars along the roadsides."

FISH SURVEY PROPOSED

AT a meeting of the game officials of Wyoming, Montana, Utah and Idaho at Yellowstone National Park on July 17th and 18th, it was proposed that congress make provision by appropriation for a survey of the streams of the Rocky Mountain region of the United States to determine what varieties of fish are suitable for each stream and what is needed to be done to provide an adequate food supply in each. Congress will undoubtedly be asked at the coming session to make such an appropriation. Participating in the conference were representatives of the National Park Service, the U. S. Forest Service, the U. S. Biological Survey and the U. S. Bureau of Fisheries.

QUAIL ACCEPT HOSPITALITY

WILLIAM B. MERSHON of Saginaw, Michigan, sends the American Game Protective Association an interesting report of the care of a bevy of quail which were looked after by a woman interested in birds during last winter near that place. She writes that she fed 27 quail at her home all winter. As soon as the birds found that they were safe and unmolested they came readily every day for their food, the feeding being placed about 7 o'clock in the morning and again about 5 o'clock in the evening. The birds found shelter at times in an old barn nearby and frequently resorted to the protection of the space beneath the porch of the house near where they were fed. Chick feed, corn meal and dry bread were used as food and it is significant that the lady caring for the quail keeps no cats.

Take the Missus Along



The feller whose playmate takes an interest in sports afield, angling and outing, is a fortunate chap. When he takes the Missus on the trip it makes the voyage worth while. Mr. and Mrs. Ira F. Boone of Helena are shown in the picture above on one of their regular fishing trips in the Blackfoot country. Mr. Boone has for years been a constructive force for wild life conservation in the county and state. Mrs. Boone is equally interested. Ira Boone is the linotype specialist who sets the type for MONTANA WILD LIFE.

Huns and Chinks

FOR the first time since the Hungarian partridge was introduced into Montana, the State Fish and Game Commission has declared an open season on this gamey bird in certain Montana counties. Many counties have also been opened to the shooting of Chinese pheasants. The open dates are November 24-28, inclusive. Stick the dates in your hat.

Territory in the following 17 counties is open to shooting of Chinese pheasants: Flathead, Petroleum, Custer, Yellowstone, Lewis and Clark, Fergus, Broadwater, Deer Lodge, Beaverhead, all of Lake county except that portion drained by the Jocko River and its tributaries; all of Ravalli county south of the Ravalli and Missoula county line and north of the Hamilton Heights road which runs east and west through the middle of Sections 13, 14, 15, 16 and part of 17 and an extension of the same line across the remainder of Section 17, of Missoula county south of a line running east and west through the town of Lolo; all of that portion of Carbon county lying east of Rock Creek and south of a line running due east and west through the town of Bridger; all of Cascade, Treasure, Rosebud and Big Horn counties.

The following territory in 15 counties is open to the shooting of Hungarians within the prescribed dates: Flathead, Glacier, Lewis and Clark, Teton, Gallatin, Deer Lodge, Yellowstone, Beaverhead, Lake county except that portion drained by the Jocko River and its tributaries; Ravalli county south of the Ravalli and Missoula county line and north of the Hamilton Heights road which runs east and west through the middle of Sections 13, 14, 15, 16 and part of 17 and an extension of the same line across the remainder of Sections 17 and 18, all in Township 6, North of Range 20 West; and all of Missoula county south of a line running east and west through the town of Lolo; all of Cascade, Treasure, Rosebud and Pondera.

According to the ruling of the State Commission "the bag limit shall be three birds which may include three Hungarian partridges of either sex or three Chinese cocks or three in the aggregate, it being the intention of the Commission that the bag limit shall be but three birds, whether they be male Chinese pheasants or Hungarian partridges of either sex and that no person shall have in his possession more than six of any such birds at any one time."

She: "What do you use these long ropes for?"

Cowboy: "We catch cattle with those."

She: "Yes, but what do you use for bait?"

Chinks at State Game Farm



J. L. Kelly

MONTANA'S state game farm is gradually becoming a reality. All the detail incident to acquiring the scenic tract at Warm Springs has been completed, five pens have been constructed and there are already 270 ringnecked pheasants and 30 Mongolians in the pens being constructed under supervision of J. F. Hendricks, General supervisor and completion of

the game farm and its buildings, equipment and stock has been placed in the hands of Joseph L. Kelly of Anaconda, senior member of the State Fish and Game Commission. Plans are being made to trap enough Hungarian partridges in the Deer Lodge valley this fall to carry through the winter for breeding stock. Carpenters are rushing work on the cottage for Superintendent Hendricks and his family.

If conditions continue favorable, the state farm will be enabled to release a large number of Hungarians, Chinese and Mongolian pheasants next fall as another step in the vast conservation program of the Montana Commission.

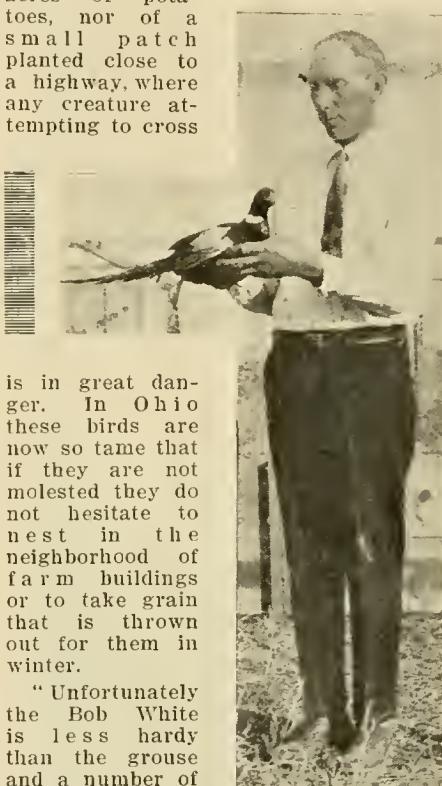
Requests are being made constantly to the Commission to attempt to plant the cheery Bob White in Montana hedges, corn fields and brush. It is possible that such plans will later be made. Sportsmen from outside the state who are intensely interested in the progressive Montana program have likewise made suggestions regarding the possibilities of planting quail in Montana and their value to sportsman and farmer alike.

Webster H. Ransom, federal game protector with headquarters at Spokane, who is well known throughout Montana, has written regarding the project, as has E. L. Moseley of the State Normal College of Bowling Green, Ohio. Montana is gaining fame as a potato growing state and Mr. Moseley comments in an interesting manner of the usefulness of Bob White to the potato grower. He writes in part:

"If the Bob White was as abundant and tame wherever potatoes are grown as it has recently become in many places in Ohio, as a result of continuous protection, there would be little further need of insecticides for combating potato beetles. More than a hundred of these pests have been devoured by a single captive Bob White in a day. When free, the birds spend much time in potato patches, if they can do so in safety. They have been seen going down the rows, picking off the insects from the vines. Where the Bob

Whites are numerous, a person would have to search through the patch for more than ten minutes to find as many beetles as may be found elsewhere on a single vine.

"Of course, one pair of birds can not be expected to take care of twenty acres of potatoes, nor of a small patch planted close to a highway, where any creature attempting to cross



Superintendent Hendricks and Chink Pheasant

is in great danger. In Ohio these birds are now so tame that if they are not molested they do not hesitate to nest in the neighborhood of farm buildings or to take grain that is thrown out for them in winter.

"Unfortunately the Bob White is less hardy than the grouse and a number of our other birds, so that its range does not extend north as far as does the region where potatoes are extensively grown. It is not found in the northern part

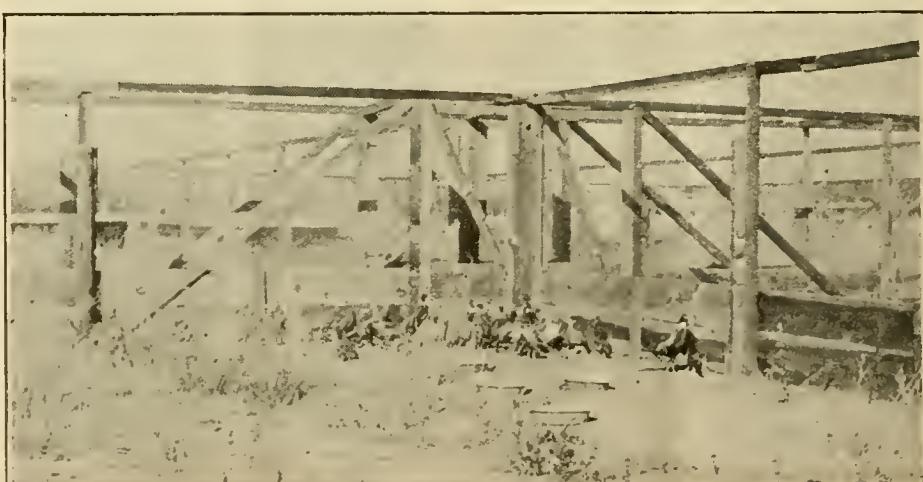
of New York or New England. Even in the latitude of New York City severe winters cause many to perish. The farmer who knows where coveys pass the winter night can easily prevent them from being long imprisoned under a crust of snow that has formed over them as a result of partial thawing, followed by freezing. Feeding them, whenever the ground is deeply covered with snow, will also save many lives.

"Measures which require more time, but which are worth while for the potato grower, are the trapping of the birds in early winter and caring for them at the barn, or constructing for them a rude shelter in the woods, where they may be fed and may stay without being observed by every prowling carnivore or predatory bird that happens to come that way. The shelter should have openings on more than one side, to permit the Bob Whites to escape from a hawk, fox, or other enemy that may enter.

"The cardinal and several other song birds have extended their range northward, probably because they are able to endure the winters better than they could before the coming of the white man. There seems to be no reason why the range of Bob White might not be extended northward a hundred miles or more, if the farmers who live along the northern habitat of these useful birds would give a little attention to their welfare in winter.

"Besides potato beetles, Bob Whites eat large numbers of grasshoppers, cutworms, army worms, white grubs, chinch bugs, squash bugs, cucumber beetles, wire worms, cotton boll weevils, flies, mosquitoes and other objectionable insects. One consumed 2,326 plant lice at one meal. Five thousand chrysanthemum black flies were eaten in a day, and another day 1,286 rose slugs.

"Where these birds are numerous and tame they probably render a greater service to the farmer than any other species of wild bird."



First View of Birds in Pens at State Game Farm

Simpson Urges Game Farms

BREEDING game birds in large numbers requires experience as well as theoretical knowledge. The difficulties which beset the game breeder can never be entirely forecast; some new problem is constantly arising. Men of long and successful experience in the breeding of game birds, however, seldom suffer serious loss because their long years of actual practice has qualified them to meet all emergencies and overcome all ordinary difficulties.

The career of Gene M. Simpson, who laid the foundation for the Montana game farm at Warm Springs, is a record of achievement and valuable service to his state. In the June-July issue of *AMERICAN GAME*, the bulletin of the American Game Protective Association, Mr. Simpson modestly describes the operations of the Oregon game farms for the past year and writes instructively on the methods employed in that state. Oregon was the scene of the first introduction of the Chinese ringnecked pheasant, having been brought to that state from China by Judge O. N. Denny in 1880, and it is an instance of appreciation all too rare that Mrs. Denny, wife of Judge Denny, now receives a pension of \$50.00 per month from the state game fund and will continue to receive it during her life in recognition of the service rendered to the state by her late husband.

Oregon operates two large game farms, the output of each being chiefly the ringnecked pheasant, which is the established upland game bird of that state.

Mr. Simpson has also achieved greater success in experiments breeding the Hungarian partridge than any one else in this country. He has found that the Hungarian can be reared in captivity with reasonable assurance of success, although it is more precarious than the breeding of pheasants and requires different methods of handling the birds during the laying period and in the rearing fields.

Last season Mr. Simpson raised 435 Hungarian partridges to maturity, all fine healthy birds, which is encouraging.

In closing his article Mr. Simpson says: "I wish to say that you must look to the game breeders of this country for your future supply of upland game birds. Restraining laws alone will not increase, or even maintain, the supply. We must produce if we would destroy."

AIRPLANE HUNTERS PROSECUTED

Violation of state and federal laws prohibiting the use of airplanes in hunting game have been on the increase. The United States Bureau of Biological Survey has found it necessary to prosecute a number of such cases, 32 such prosecutions having been brought since the enactment of the Migratory Bird Treaty Act.

AWARD TO JACK MINER

TO PROVE that governments are not wholly ungrateful, the Canadian Dominion Parliament at its last session unanimously voted an appropriation of \$5,000 to Jack Miner to assist him in feeding his thousands of waterfowl that use his ponds at Kingsville, Ontario, as a feeding station on their north and south migrations. The number of birds resorting to Jack Miner's sanctuary has grown to such an extent that it has all but bankrupted him to provide food for their needs. The entire proceeds of his lectures have been devoted to purchasing grain. Donations have been made to him by a few wealthy friends, without which he could not have met the requirements.

MAMMOTH FISH HATCHERY

ACCORDING to announcement of the Arkansas Game and Fish Commission, that state is now constructing what, when completed, will be the world's largest fish hatchery. It is being constructed near Lonoke, Arkansas, under the supervision of Del Brown of the U. S. Bureau of Fisheries, an experienced fish hatchery builder and superintendent who has been loaned to the state of Arkansas for this undertaking. Mr. Brown is officially in charge of the U. S. Fisheries Station at Mammoth Springs, Arkansas. The Arkansas hatchery, when completed, will include 244 acres of ponds and will be devoted to the propagation of the warm water nest building fishes such as bass and bream.

Skimson: "I've got half a mind to get married."

Knutson: "Well, that's all you need."

PHEASANT PROPAGATION

MICHIGAN and Wisconsin produced at their game farms this year a total of 30,000 pheasant eggs. Each state set as large a percentage of the eggs as possible at the state game farms and distributed the others to private individuals for hatching. The distribution of birds from the two states will approximate 15,000, besides those reared by private individuals.

VIRGINIA IMPORTING DEER

STRANGE as it may seem, with its vast areas of wilderness mountain country, Virginia is finding it necessary to import deer to restock her depleted forests. Recently thirty whitetailed deer were procured by the State Commission of Game and Inland Fisheries from the Pisgah National Forest of North Carolina, purchase having been made of the U. S. Forest Service at \$25.00 per head. The deer will be distributed and liberated in various parts of the state in favorable localities. Virginia has large areas well suited to deer.

STRANGE BEDFELLOW

A young operator had a fine collection of East African trophies, and amongst them a splendid buffalo head.

"What a wonderful head!" said his intended bride who had come to visit his home. "How did you get that? Was he very savage?"

"I had a deuce of a time with that buffalo," replied the hunter. "Never had such a morning in my life, I shot it in my pajamas."

"Good heavens!" murmured the sweet young thing. "How did it get there?"

Yak Herd in the Canadian Rockies



This snapshot, taken by A. G. Gillespie of Grass Range, Montana, shows a good sized family of yak in the Rockies north of the Montana line, grazing peacefully in the mountain valley.

Keeping Up the Game Supply

HOW New York state maintains a game supply sufficient to provide public hunting for hundreds of thousands of sportsmen was told by Herbert F. Prescott, secretary of the Conservation Department in a recent radio talk, of particular interest to Montana sportsmen. In the course of this talk he said:

"To maintain a supply of wild life that will support an annual take of over 2,000 tons requires intelligent laws governing open seasons, the strict enforcement of those laws, the propagation of certain species and the importation of other species.

"The seasons and bag limits as at present fixed appear to insure a continued supply. Deer are more than holding their own and today are found in agricultural counties where they had not been seen for many years, rabbits show an increased bag every year and pheasants have shown a rapidly rising take each year for the last ten years.

"Strict enforcement of the game law which was not too popular a few years ago is now recognized by sportsmen generally as absolutely essential to the perpetuation of the game supply and sportsmen's clubs are as much interested in enforcing the laws as are the game protectors themselves. This does not mean that the game laws are not violated but it does mean that violators are in jeopardy not only from the protectors but from sportsmen who don't want their hunting spoiled by game hogs.

"There is one factor in the conservation of the state's wild life that has not received the attention that it should. This is the class of predatory birds and animals classified as 'vermin,' that prey upon the more valuable species. These take an enormous toll of young birds and animals. More attention is being paid to vermin control than in former years and it is noticeable that there is better hunting in localities where clubs are active in the suppression of vermin.

"New York state raises birds on a large scale. Twenty years ago it established its first game bird farm at Sherburne in Chenango county for the propagation of pheasants. Harry T. Rogers, a thoroughly experienced bird raiser, was placed in charge of the farm which was a success from the start. Since

the establishment of the first farm three others have been acquired at Middle Island, Suffolk county; Brownsville, Jefferson county, and Ithaca, Tompkins county, all of which are under the supervision of Mr. Rogers. The first year of the Sherburne farm the birds laid an average of 19 eggs per bird. By selective breeding the number of eggs per bird has been increased to 58 which was the average number of eggs laid by pheasants on the farms in 1928. In addition to the Chinese ringnecked pheasants the state is now undertaking the breeding of the Reeves pheasant and in time this will make a splendid addition to our game birds.

"For three years the state has been importing a new game bird, the Hungarian partridge. Remarkable success has been had with this bird in some of the northwestern states and the early reports on broods released in this state have been decidedly encouraging.

"Ever since the state began the distribution of the Hungarians a close check has been made to ascertain how they are doing in their new environment. Game protectors are instructed to observe conditions in the localities where they have been released and detailed surveys have been made in sev-

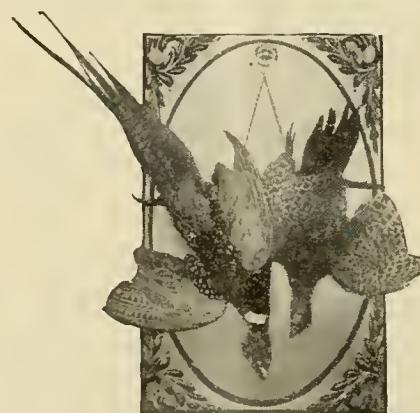
eral counties by sportsmen's clubs. The reports made by the game protectors and the results of the surveys have been generally satisfactory and show that the birds are breeding well.

"Purchases of game birds and animals are made from what is known as the conservation fund which is made up from one-half of the receipts from the sale of hunting licenses and which is used for the improvement of hunting and fishing conditions.

"This year there has been appropriated for the improvement of the game supply \$100,000 to be used for a game survey and purchase of game birds and animals and food for birds.

"The conservation fund also has made possible the establishment of game refuges and public hunting grounds. These game refuges will play an important part in the conservation of the state's wild life, giving the game breeding places where they will not be molested by hunters or decimated by vermin.

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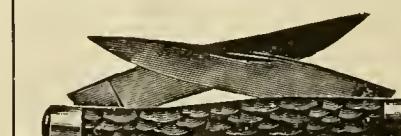
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Birth From A Grave

LAWS of nature seem to have been inverted when applied to that continent of the southern hemisphere embraced in the Island of Australia. Many of the strange creatures of the animal kingdom inhabiting that country have no counterpart anywhere else in the world.

One of the most astonishing in its paradoxical habits is the Mallee-fowl, a bird which buries its eggs in the ground or in a heap of sand or rubbish and leaves them there to be hatched by the heat of the sun. This bird is not abundant and is said to be in danger of extermination.

T. P. Bellchambers of Hambug Scrub, South Australia, a corresponding member of the American Game Protective Association, who has established a sanctuary for the preservation of the mammal and bird life of that region, writes of the experience he has had in breeding the Mallee-fowl under protection, which has given him an opportunity to observe its strange habits.

Writing in January, Mr. Bellchambers says:

"The Mallee-fowl (*Leipoa ocellata*) are just now proving interesting in that chicks are now arriving. This season being favorable we are expecting better success than the last season or two when summer rains spoiled our chances. Conditions here are very different to those of this bird's natural habitat.

"His Majesty the King was pleased to accept from me a pair of these interesting birds. They were bred here from a pair, the female of which is 15 years old and the male 14 years. This pair invariably places the first egg in the mound in late August and the female is still laying on January 18th. I have two other pairs working. This bird should do well in the dryer parts of your country and it might be worth while trying them. It is becoming increasingly difficult to find in its wild state in Australia but without doubt it could be saved from its threatened doom if placed on properly protected reserves in the Mallee lands. (Mallee is the name of a dwarf eucalyptus tree.) Some years ago a few birds were put on Kangaroo Island reserve

but nothing has been heard of them since. The pity of it is that our people will not see the importance of taking such action in time, no less than seven species of marsupial life having disappeared from over a wide area of this state within the last twenty years and our avi-fauna have likewise suffered very grievous losses."

The Mallee-fowl inhabits the dryer parts of Australia but is widely scattered and becoming rare. It deposits its eggs in mounds of sand and rubbish which are from ten to twenty feet in diameter and about two and a half feet high. The eggs, which are about three and a half by two and a half inches in size, are buried some eighteen inches deep and are deposited over a period of three or four months. The incubation period is about two months. When the chicks hatch they dig themselves out and receive no attention whatever from their parents, having to shift for themselves from birth. The adults pay more or less attention to the care of the mounds in which the eggs are placed by scratching off the surface occasionally in order to admit the heat of the sun. They appear to understand the necessity for this, varying their operations according to the weather.

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The birds are about the size of domestic fowl. They build the mounds in which the eggs are placed by scratching the sand in a heap with their feet. The vast amount of labor required may well be imagined from the size of the mounds.

Mother: "Johnny, if you eat more cake, you'll burst."

Johnny: "Well, pass the cake and get out of the way."

THE DUSKY PEDANT

Lawyer: "Can you tell me if the defendant was expensively garbed?"

Rastus (a witness): "Deed she was, sah. Ah knows expensive garbage when I sees it."

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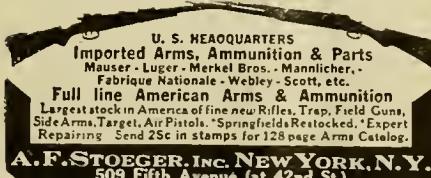
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Bear Paw Marks on Montana Trees



THE "tree marking habit" by which bruin innately betrays his prowess, indicates bear were more plentiful before hibernating season this year than ever before in the South Fork country just south of Glacier Park boundary, according to Mike Shannon, a veteran Rocky Mountain guide.

On a recent mountain lion hunting trip through the timbered country in this remote mountain region to the south of here, Shannon says he found the bark of several of the forest trees clawed as trees never were clawed before. As he explains, "whenever a bear comes into a new locality it proceeds to the 'marking tree' which is used by all bears to sharpen their claws. This year one big tree apparently wasn't enough for the number of new bear arrivals, so they clawed up several of the forest giants as markers.

"The newly arrived bear is careful to measure the height reached by his claws with the mark left by 'previous arrivals.' If the claws of the newcomer reach as high on the tree, or higher, than the old claw marks, the new arrival will linger around confidently, ready to fight it out with any bear he might meet.

"But, on the other hand, if his claw marks are below the other claw marks on the tree, Old Bruin has the realization of a 'whipped cur' and he slinks away to a region where there are shorter pawing bear than he. But he doesn't hang his tail between his legs like a whipped cur, because a bear hasn't got any tail to hang between his legs in that way."

The big black bear pictured at the top has the highest claw marks on one of the giant forest trees near the Granite Park Chalets. However, he is a tame old fellow and very friendly with the Park visitors who have sweets to offer him.

Shannon predicts that there will be some great bear fights when all these bears come out of their mountain-side dens, and vegetation grows up profuse enough for them to get into training for the great out-door supremacy battles. Elimination bouts are quickly consecutive when these heavyweights get started, he says, "because there ain't any 'gate' for them to worry about."

Animal Islands

BETWEEN the East Coast of Africa and Madagascar is an island inhabited solely by dogs. The name, says the Detroit News, is Juan De Nova. It is stated that in the old days of the sail East Indiamen and Portuguese sailors used to stop at this island, which was uninhabited, for fresh water, fruits and turtles. Domestic dogs of every breed carried on some of these boats often escaped to the island and were left behind. Today the descendants of this mongrel horde have turned wild and have taken full possession of the island. They have reverted to the habits of the wolf and carry their bodies and howl like their wild ancestors.

This story calls to mind the number of islands in the Great Lakes that are fully and completely possessed by various species of wild life. Gulf Rock, lying off the north shore of Isle Royale, is one. This great rock, of some five acres in extent, thrown up out of the bottom of Lake Superior, has been the home of thousands of herring gulls, undoubtedly for ages. During the nesting period every foot of the island is dotted with nests and crying young. The birds show alarm only when one sets foot on the rocky shore and treads among the spotted babies.

There are parts of the Beaver group of islands in Lake Michigan that are completely dominated by common terns and at this point more terns have been banded than any other place in America.

Little Crane Island is the home of hundreds of deer during the period the fawns are born. The does swim across the channel between this island and the mainland before they are ready to give birth to the fawns and they remain there until the youngsters are able to swim to the mainland. In this way the danger of attack from wolves and coyotes during this critical period is eliminated.

Montana Pike



THROUGH utilizing a systematic method of seining out the carp and suckers in Nelson Reservoir, the State Fish and Game Commission is gradually winning the battle to save the transplanted pike and pickerel. The picture above, submitted to MONTANA WILD LIFE by Deputy Warden Harry Cosner, whose headquarters are at Malta, shows a few of the big fellows taken from the reservoir.

Senor Yip-Yap on His Way to Become a Rug



Here are two unusual Montana snapshots showing a closeup view of a huge coyote held fast in a predatory animal hunter's trap. He'll soon be a rug or a lady's fur marked "Alaska Red Fox" or something else. State and federal predatory animal hunters are ridding the range of these pests. Stockmen and the State Fish and Game Department are cooperating in the employment of experienced trappers and hunters in the work. Farmers likewise realize the value of the campaign. The fur, when prime, is becoming valuable.

